

REMARKS

Claims 1-7, 9, and 12-24 are pending in the present application. Claims 1, 3-7, 13, 15, 17-20 and 22-23 have been amended. No claims have been canceled. Claim 24 has been added.

1. The Office Action mailed 6/2/2009 indicates *"Applicant's arguments filed 3/26/2009 have been fully considered but they are no persuasive. ... after the coarser particles are separated out via separator 4 the other particles are sent to one or more cyclones 5. The series of cyclones will provide the finest particles as claimed."*, page 2, lines 1-4.

In effect, when the particle size is reduced to the ultrafine size that is being addressed here, the weight to surface area ratio becomes so small, that cyclones are very inefficient. Dust of this size is collected using 'bag house' filter systems and electrostatic precipitators, as in the present invention. Cyclones will be very inefficient or non-operable at these particle sizes. Therefore, the indication of the use of cyclones by the Prior Art and does not obviate the use of dust extractors used in the present invention.

2. Claims 1, 2, 3, 6, 7, 12, 14, 18, 19 and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable, whereby independent claim 1 has been found to be unpatentable over Prior Art in view of DE3841874 .

The present invention is designed to separate dust particles at least into three groups, by particle size. The coarse particles are sent back to the grinder, the intermediate sized particles are separated using a cyclone and sent to an intermediate silo. The finest particles are separated from the gases by a dust collecting means. Therefore *"a grinding station"*, *"a separator"*, *"a cyclone"* and a *"dust extractor"*, all are required to achieve the advantages of the present invention. DE3841874 does not disclose nor suggest these parts used in this arrangement to achieve the same results.

DE3841874 functions on the principal that in a stream of various sized particles entrained in a flowing gas, the largest particles flow in the central stream and the smaller sized particles gravitate to the outer perimeter of the stream. DE3841874 has different structures unrelated to the present invention designed to 'skim' off the peripheral stream and with it, the smallest particles on the periphery of the stream. The particle size

distribution within the stream is dependent upon a number of factors, one being the velocity of flow. Since these structures are designed not to be adjustable, it logically follows that if the stream flow varies, the particle size ‘skimmed off’ will also vary. Varying the particle sizes varies the flames and the combustion produced.

The claims of the present invention require “*a separator*”, “*at least one cyclone*” and “*a dust extractor*” that do not depend upon many variables and are designed to extract consistent particle sizes. This is not the case with DE3841874 that may skim a variety of particle sizes as conditions change.

DE3841874 also indicates that the stream spirals around the inside of the pipes at a significant flow rate. Centrifugal force then moves the heavier (larger) particles toward the outer surface of the pipes, contrary to the theory of the device disclosed in DE3841874.

Examiner contends that Prior Art discloses all the limitations of claim 1 except for the limitation that the ultrafine particles are “*then introduced into the combustion chamber via at least one dedicated pipe and burned by at least one dedicated burner.*” Examiner further contends that DE3841874 shows this limitation for the purpose of improving the firing process. Consequently, Examiner finds that “[I]t would have been obvious to one of ordinary skill in the art to modify the Prior art by including [the finest particles] which are then provided by a dedicated pipe to a dedicated burner for burning in the combustion chamber, ... as taught by DE3841874 for the purpose of improving the firing process.” Further, Examiner states that the Applicants are merely combining prior art elements according to known methods to yield predictable results.

In addition to Applicant’s arguments put forth in the Amendment/Remarks filed July 31, 2008, Applicants submit the following additional arguments to the patentability of the presently claimed invention particularly, claim 1.

As noted by the Examiner, DE3841874 shows “*a dedicated pipe to a dedicated burner for burning in the combustion chamber*”. While DE3841874 does show this limited feature, the reference does not show a dedicated pipe that provides the ultrafine particles intercepted by a dust extractor to a dedicated burner for burning in a combustion chamber, as claimed by Applicants in claim 1.

The Prior Art in Fig. 1 and Fig. 2 shows two different alternates on how to handle the finest particles entrained in the air flow. The Prior Art in Fig. 1 provides the fine particles entrained in the air flow directly from the cyclone to the combustion

chamber without extracting the ultrafine particle from the air flow first. Alternatively, the Prior Art of Fig. 2 extracts the finest particles from the air flow and combines the fine particles and finest particles together and provides this mixture to a main burner. Neither Prior Art teaches or suggests providing the ultrafine particles extracted by a dust extractor to a burner through a dedicated pipe. The Prior Art simply teaches or suggests that these two methods provide a means to limit the exhaust of these finest particles into the atmosphere. (p. 1, lines 14-18, p. 3, lines 3-8 of Applicant's application). Therefore, there is no appreciation or teaching of the use of the finest particles for stabilizing combustion as indicated by the Applicants. Consequently, there is no motivation in the Prior Art to extract the finest particles from the air flow and provide it to a burner through a dedicated burner.

Examiner further looks to overcome this lack of teaching or suggestion by looking to DE3841874. However, there is no suggestion, teaching or motivation in DE3841874 to employ a dust extractor to extract the finest particles from the air flow. In fact, DE3841874 teaches away from having a dust extractor. The aim of the invention of DE3841874 is *"to find the conveying gas and/or dust immediately after the impacting wheel, using the speed of the flow for effective firing and for optimal operation of the coal dust ventilator mill" at low cost.* (emphasis added) (p. 2, lines 8-16) Applicants therefore submit that one skilled in the art would have no motivation to combined teachings of the Prior Art and the teachings of DE3841874. As indicated above, DE3841874 employs the idea of collecting the smallest particles on the periphery of the main stream, instead of a more accurate method of using dust extractors such as the bag house filters and electrostatic precipitators of the present invention.

Even if the teaching of the Prior Art and DE3841874 were combined, the Applicants claimed invention would not result. The resulting configuration would be to provide the air from duct 100 of the Prior Art of Fig. 2 to a vapor burner. Applicants therefore contend that claim 1 is not rendered obvious in light of Prior Art in view of DE3841874 for at least the reasons provided hereinbefore, and it is respectfully requested that the rejection be withdrawn and claim 1 be allowed.

Claims 2, 3, 6, 7, 12, 14, 18, 19 and 20 variously depend on independent claim 1, and therefore are not rendered obvious by Prior Art in view of DE3841874, and it is respectfully requested that these claims be reconsidered and allowed for at least the reasons provided hereinbefore.

3. Claims 4, 21 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable, whereby independent claim 4 has been found to be unpatentable over Prior Art in view of EP0747629.

Examiner contends that Prior Art discloses all the limitations of claim 4 except for the limitation that the finest particles are *“then introduced into the combustion chamber via dedicated pipes and injectors downstream of main burners.”* Examiner further contends that EP0747629 shows this limitation of *“provided by a dedicated pipe to a dedicated injector to introduce the finest particles into the combustion chamber”*. Consequently, Examiner finds that *“[I]t would have been obvious to one of ordinary skill in the art to modify Prior art by including provided by a dedicated pipe to a dedicated injector to introduce the finest particles into the combustion chamber ... as taught by EP0747629 for the purpose of burning powdered fuel to reduce NOx.”* Further, Examiner states that the Applicants are merely combining prior art elements according to known methods to yield predictable results.

Applicants traverse Examiner’s contention that the teachings of Prior Art and EP0747629, when combined, would result in the Applicants’ invention of amended claim 4.

In addition to Applicant’s arguments put forth in the Amendment/Remarks filed July 31, 2008, and those above, Applicants submit the following additional arguments to the patentability of the presently claimed invention particularly, claim 4.

As asserted by the Examiner, EP0747629 shows a dedicated pipe to a dedicated injector to introduce the finest particles into combustion chamber. While EP0747629 does show a dedicated pipe providing finer particles to the combustion chamber, the reference does not show a dedicated pipe that provides the ultrafine particles intercepted by a dust extractor to a dedicated injector to introduce the ultrafine particles into the combustion chamber, as claimed by Applicants in claim 1. EP0747629 simply separates finer particles from coarse particles and provides these particles to the combustion chamber via separate ducts. EP0747629 does not show or suggest that these fine particles may be further separated to provide even finer particles to the combustion chamber. The present invention has three particle size gradations, a coarse size that require, re-grinding, a fine size for the main burner and an ultrafine size for the dedicated pipe and dedicated burner. The separator intercepts the coarse particles, the cyclone intercepts the fine particles and the dust collector intercepts the ultrafine particles.

Therefore, Applicants contend that combining the Prior Art and EP0747629 would not result in the Applicants' invention, as recited in claim 4. The resulting configuration would simply provide the air flow from the duct 8 of Fig. 2 (Prior Art) to the combustion chamber. EP0747629 teaches away the need to include a dust extractor.

Applicants therefore contend that claim 4 is not rendered obvious in light of Prior Art in view of EP0747629 for at least the reasons provided hereinbefore, and it is respectfully requested that the rejection be withdrawn and claim 4 be allowed.

Claims 21 and 22 variously depend on independent claim 4, and therefore are not rendered obvious by Prior Art in view of EP0747629, and it is respectfully requested that these claims be reconsidered and allowed for at least the reasons provided hereinbefore.

4. Claim 5 stands rejected under 35 U.S.C. §103(a) as being unpatentable, whereby claim 5 has been found to be unpatentable over Prior Art in view of EP0747629 and further in view of US Patent 4,270,895 Vatsky.

Claim 5 variously depends on independent claim 4, and therefore is not rendered obvious by Prior Art in view of EP0747629 and further in view of Vatsky. Vatsky does not add the required disclosure that was missing from the Prior Art description and EP0747629. The idea the interception of ultrafine particles using a dust extractor that are sent by a dedicated pipe to a dedicated burner in the combustion chamber are lacking in the Prior Art, EP0747629 and Vatsky.

It is respectfully requested that this claim be reconsidered and allowed for at least the reasons set forth above.

5. Claim 9 stands rejected under 35 U.S.C. §103(a) as being unpatentable, whereby claim 9 has been found to be unpatentable over Prior Art in view of DE3841874 and further in view of FR 2,534,359.

Claim 9 variously depends on independent claim 1, and therefore is not rendered obvious by Prior Art in view of D1 and further in view of FR 2,534,359. FR 2,534,359 does not add the required disclosure that was missing from the descriptions in the Prior Art and D1 described above. It is respectfully requested that this claim be reconsidered and allowed for at least the reasons provided hereinbefore.

6. Claim 9 stands rejected under 35 U.S.C. §103(a) as being unpatentable, whereby claim 9 has been found to be unpatentable over Prior Art in view of DE3841874 and further in view of US Patent 6,369,680 Tobias ("Tobias").

Claim 9 variously depends on independent claim 1, and therefore is not rendered obvious by Prior Art in view of DE3841874 and further in view of Tobias, and it is respectfully requested that this claim be reconsidered and allowed for at least the reasons provided hereinbefore.

7. Claim 9 stands rejected under 35 U.S.C. §103(a) as being unpatentable, whereby claim 9 has been found to be unpatentable over Prior Art in view of DE3841874 and further in view of EP 976977.

Claim 9 variously depends on independent claim 1, and therefore is not rendered obvious by Prior Art in view of DE3841874 and further in view of EP 976977, and it is respectfully requested that this claim be reconsidered and allowed for at least the reasons provided hereinbefore.

8. Claim 13 stands rejected under 35 U.S.C. §103(a) as being unpatentable, whereby claim 13 has been found to be unpatentable over Prior Art in view of DE3841874 and further in view of Lingl (4,092,094).

Claim 13 variously depends on independent claim 1, and therefore is not rendered obvious by Prior Art in view of DE3841874 and further in view of Lingl, and it is respectfully requested that this claim be reconsidered and allowed for at least the reasons provided hereinbefore.

9. Claim 15 stands rejected under 35 U.S.C. §103(a) as being unpatentable, whereby claim 15 has been found to be unpatentable over Prior Art in view of DE3841874 and further in view of Shuman (2,083,126).

Claim 15 variously depends on independent claim 1, and therefore is not rendered obvious by Prior Art in view of DE3841874 and further in view of Shuman, and it is respectfully requested that this claim be reconsidered and allowed for at least the reasons provided hereinbefore.

10. Claim 16 stands rejected under 35 U.S.C. §103(a) as being unpatentable, whereby claim 16 has been found to be unpatentable over Prior Art in view of DE3841874 and further in view of Malaubier et al. (6,415,743).

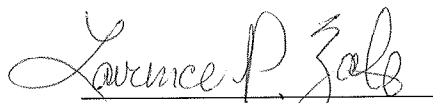
Claim 16 variously depends on independent claim 1, and therefore is not rendered obvious by Prior Art in view of DE3841874 and further in view of Malaubier et al, and it is respectfully requested that this claim be reconsidered and allowed for at least the reasons provided herebefore.

11. Claim 17 stands rejected under 35 U.S.C. §103(a) as being unpatentable, whereby claim 17 has been found to be unpatentable over Prior Art in view of DE3841874 and further in view of Vatsky (4,253,403).

Claim 17 variously depends on independent claim 1, and therefore is not rendered obvious by Prior Art in view of DE3841874 and further in view of Vatsky, and it is respectfully requested that this claim be reconsidered and allowed for at least the reasons provided herebefore.

12. A Petition for Revival of an Application for Patent Abandoned Unintentionally Under 37 CFR 1.137(b) is filed concurrently herewith, whereby this Amendment will be deemed to have been timely filed. Please charge the fee of \$1620.00 for the Petition for Revival to Deposit Account No. 03-2578, Order No. VA30429. Any deficiency or overpayment should be charged or credited to Deposit Account No. 03-2578, Order No. VA30429.

Respectfully submitted,



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